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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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NGUYEN, DUC M	

ART UNIT	PAPER NUMBER
2685	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/718,312	RAUSCH ET AL.	
	Examiner	Art Unit	
	Duc M. Nguyen	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,8,9,11-23,26-38,40,41,44-50,52-60,62,64 and 66-68* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,8,9,11-23,26-38,40,41,44-50,52-60,62,64 and 66-68* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

ey

DETAILED ACTION

This action is in response to applicant's response filed on 11/3/05. Claims 1, 3-5, 8-9, 11-23, 26-38, 40-41, 44-50, 52-60, 62, 64, 66-68 are now pending in the present application. **This action is made final.**

Response to Arguments

Applicant's arguments filed 11/03/05 have been fully considered but they are not persuasive.

Recall that it has been known in the art that the timing signal of an oscillator is subject to variations caused by temperature variations or aging of the components. This results in long-term frequency drift of the oscillator signal. Therefore, attempts has been made to correct timing signal of communication devices by synchronizing/calibrating timing signals of these communication devices to a same stable, highly accurate reference timing signal such as a rubidium oscillator timing source or a GPS based timing signal. By synchronizing (or recalibrating) the timing signal of the oscillators to the same stable, highly accurate reference timing signal, the carrier frequency of the oscillator signal generated by different communication devices would be based on the same reference timing signal, thereby result in high accuracy frequency synchronization. Here, by generating a carrier frequency of the oscillator based on the same stable reference timing signal, the oscillator would generate a "stabilized" oscillator signal as called, claimed by the Applicant.

However, in Applicant's response, Applicant argues that while the cited prior arts (namely, Rudow, Gehrke, Bickley and Nielsen) teach or suggest a GPS timing signal is used to resynchronizing, correcting or recalibrating the real-time clock of the oscillator, they fail to teach "an oscillator stabilized by a GPS-based timing signal" or "using a GPS timing signal as an input to an oscillator to generate a stabilized oscillator signal".

In response, the Examiner asserts that since the cited prior arts (namely, Rudow, Gehrke, Bickley and Nielsen) teach or suggest a GPS timing signal is used to resynchronizing, correcting or recalibrating the real-time clock of the oscillator, and since the oscillator signal would be generated from the recalibrated real-time clock (i.e, via a phase lock loop or synthesizer), they **implicitly** teach "an oscillator stabilized by a GPS-based timing signal" or "using a GPS timing signal as an input to an oscillator to generate a stabilized oscillator signal" as claimed. The arguments as presented by Applicant are simply based on a different "terminology" such as "stabilized oscillator signal".

Here, based on the disclosure of the specification, **page 13, line 20 to page 16, line 6**, it is clear that claimed "stable" timing signal of the claimed "stable" oscillator is **synchronized** with GPS timing signal in the similar way as of the cited prior arts (see specification, **page 13, lines 22-23** and page **15, lines 22-23**, noting for the term "synchronized"). Therefore, it is believed that the teachings of Rudow, Gehrke, Bickley and Nielsen regarding the GPS timing signal used for resynchronizing, correcting or recalibrating the real-time clock of the oscillator would implicitly teach or suggest the

claimed limitation of "an oscillator stabilized by a GPS-based timing signal" or "using a GPS timing signal as an input to an oscillator to generate a stabilized oscillator signal".

For foregoing reasons, the examiner believes that the pending claims are not allowable over the cited prior art.

Claim Rejections - 35 USC ***3 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims **8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Georges** et al (US **6,014,546**) in view of **Rudow et al** (US Pat No. **5,689,431**).

Regarding claim **8,** Georges discloses a system comprising:

an antenna configured to receive a communication signal at a communication tower (see Fig. 9 and col. 4, lines 58-67);

a stabilizing system configured to generate a stable timing signal (see col. 4, lines 58-67), the stabilizing system comprising:

a timing source configured to generate the stable timing signal (see Fig. 1, ref. 66 and col. 7, lines 30-42);

a stabilized local oscillator configured to receive the stable timing signal and to use the stable timing signal as an input to generate a stabilized oscillator signal (see Fig. 4, ref. 58 and col. 9, lines 18-37); and

a converting system configured to convert the communication signal from the frequency to a stable lower frequency using the stabilized oscillator signal (see col. 9, lines 33-38).

However, **Georges** fails to disclose the "stable" timing signal comprises a GPS based timing signal. However, **Rudow** disclose a system wherein a base station use the GPS "stable" timing signal to recalibrate clock (or timing signal) errors of the oscillators caused by temperature drift, for improving stability of the oscillators in order to obtain a good synchronization (see Fig. 1 , col. 6, lines 53-56, col. 7, lines 30-35, col. 9, lines 35-37, col. 14, lines 31-48 and col. 35, lines 57-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporating the above teaching of Rudow to George for utilizing a GPS based timing signal to recalibrate clock (or timing signal) errors of the oscillators as well, for improving the stability of the oscillators caused by temperature drift or aging components.

Regarding claim **9**, the claim is rejected for the same reason as set forth in claim 8 above. In addition, Georges discloses a "block converter" as claimed (see col. 9, lines 34-37).

3. Claims **1, 3-5, 14, 16-21, 23, 28, 31, 35-38, 40, 45, 48-49, 54, 56-60** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Georges** in view of **Rudow** and further in view of **Ariyavisitakul** et al (US Pat No. **5,936,754**).

Regarding claims **1, 3-5, 14, 17, 21, 28, 31, 35-37, 40, 45, 48, 54, 56-59**, the claims are rejected for the same reason as set forth in claim 8 above. However, Georges fails to disclose an optical conversion system. However, since **Georges** suggests that a fiber-optic cable can be used for transmission, it is clear that when using the fiber-optic cable for transmission, an optical conversion system as claimed would obviously be used as disclosed by **Ariyavisitakul** (see Fig. 4 and col. 6, lines 4-30), in order transmit the electrical RF signal over the fiber-optic cable.

Regarding claims **18-20, 49,** the claims are rejected for the same reason as set forth in claim 1 above. In addition, **Georges** would disclose an "inserter" as claimed (see col. 7, lines 54-60). Further, since AC power is used for operating the system (see **Georges**, col. 11, lines 63-67), it is clear that a transformer would be needed to transform power from a first level to a second level as claimed (i.e, 110 or 220 V), in order to provide a suitable power supply to the system.

Regarding claim **21**, the claim is rejected for the same reason as set forth in claim 20 above. In addition, it is clear that a power distributor would be needed in order to supply power to each component of the system (see **Georges**, col. 11, lines 63-67).

Regarding claims **16, 38, 60**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, it would have been obvious to one of ordinary skill in the art to provide an amplifier as claimed, for improving signal reception quality.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a suppressor is well known in the art (Official Notice), for suppressing interferences, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Georges** and **Ariyavisitakul** to further provide a suppressor to suppress interferences as claimed, for improving signal reception quality.

4. Claims **30, 32, 41-42, 44, 55, 64, 66** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Georges** in view of **Rudow** and **Ariyavisitakul** and further in view of **Quayle** et al (US Pat No. **6,865,169**).

Regarding claims **30, 32, 41-42, 55, 64**, the claims are rejected for the same reason as set forth in claim 1 above. However, Georges fails to disclose a MMDS signal. However, **Quayle** discloses a base station which operates in MMDS bands (see col. 3, lines 10-31). Since **Georges** suggests that the system can belong to other RF bandwidths such as satellite television, interactive multi-media video, high bit-rate local area networks, it a fiber-optic cable can be used for transmission (see col. 8, lines 22-36), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Georges to support MMDS system as disclosed in **Quayle**'s reference as well, for utilizing advantages of MMDS bandwidth such as providing Internet access to subscribers.

Regarding claims **44, 66**, the claims are rejected for the same reason as set forth in claim 8 above. In addition, it would have been obvious to one of ordinary skill in the art to provide an amplifier as claimed, for improving signal reception quality.

5. Claims **1, 3-5, 8-10, 14-17, 22-26, 28-29, 31, 35-40, 45-52, 54, 56-62, 67** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo et al** (US Pat No. **6411825**) in view of **Rudow et al** (US Pat No. **5,689,431**).

Regarding claims **8, 35, 57**, **Csapo** discloses a wireless communication system comprising an antenna located at a communication tower (see **Fig. 9** and **col. 6, lines 28-42**), comprising:

- a communication tower (see Fig. 9);
- an antenna (see Fig. 9, ref. 120);
- a frequency converter (implicitly disclose in col. 4, lines 43-50), wherein in order to convert a high frequency signal to a low frequency signal and vice versa, a frequency converter (also known as mixer) is needed. Since "the block conveter" is just a mixer or frequency converter (see specification, line 23 of page 11), the frequency converter would read on the "block converter";
- a fiber optic transmitter (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optical/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, <u>Csapo would obviously disclose a fiber optic transmitter when using the fiber cable for transmission</u>;

- a fiber optic receiver (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optic/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic receiver when using the fiber-optic cable for transmission;
- a converting system configured to convert a communication signal to a lower frequency signal, and to convert the lower frequency signal to an optical signal, and to transmit the optical signal to an optical receiving system (see col. 4, lines 43-50 and col. 6, lines 55-59). Since Csapo discloses a frequency converter, a fiber optic transmitter and a fiber optic receiver as explained above in the preceding paragraphs, it is clear that Csapo would obviously disclose such converting system when using a fiber-optic cable for transmission;
- a stable timing source located at a base of a tower (see Fig. 13, ref. 140 regarding GPS receiver, Time & Frequency Generator and col. 7, lines 22-26), wherein it is clear that the GPS timing signal is a "stable" timing signal (see specification, page 8, line 6);
- a GPS receiver (see Fig. 13, ref. 140);
- amplifiers (PA and LNA), a filter (see col. 7, lines 30-45);
- a frequency synthesizer (see), which would inherently generate a stabilized local oscillator signal;

However, Csapo fails to disclose the GPS "stable" timing signal is used to generate a "stable" oscillator signal. However, **Rudow** disclose a system wherein a base station and carts use the GPS "stable" timing signal to recalibrate clock errors of the oscillators caused by temperature drift, for improving stability of the oscillators in order to obtain a good synchronization (see Fig. 1 , col. 6, lines 53-56, col. 7, lines 30-35, col. 9, lines 35-37, col. 14, lines 31-48 and col. 35, lines 57-63). Since **Csapo** further discloses that the GPS provides "accurate clock" and "frequency signals" to the main unit PMU and the remote unit PRU (see **Csapo, col. 7, lines 22-27**), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teachings of **Rudow** to **Csapo** for using the GPS timing (or "accurate clock") signal to recalibrate clock errors of the oscillators of the PMU and of the PRU as well, thereby result in generating a "stabilized" oscillator signal as claimed, for improving the stability of the oscillators. Therefore, by providing the GPS timing to calibrate the oscillators, this would generate a "stabilized" local oscillator signal to the frequency converter, it is clear that Csapo as modified would disclose a "frequency converter" that would mix a communication signal with the "stabilized" local oscillator signal, thereby convert the frequency of the communication signal to a "stable" lower (IF) frequency signal, and would convert the "stable" lower (IF) frequency signal to an optical signal when using a fiber-optic cable for transmission, this would read on a "block coverter" or a "converter system" as claimed.

Regarding claims **1, 3-5, 9-10, 14-17, 22, 24-26, 29, 31, 36-40, 45-48, 50-52, 56, 58-62, 67** it is clear that **Csapo** as modified would disclose block converter, GPS timing

source, external receiver (GPS receiver), amplifier, filter, optic transmitter and optic receiver (when using a fiber-optic cable for transmission) as claimed, for the same reason as set forth in claim **8** above. Also note that the filter in Csapo's reference would obviously filter at least one member of a group comprising emissions and another communication as claimed, for improving signal reception quality.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a suppressor is well known in the art (Official Notice), for suppressing interferences, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Csapo** and **Rudow** to further provide a suppressor to suppress interferences as claimed, for improving signal reception quality.

Regarding claims **28, 49, 54**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, since the GPS receiver of the PMU is located at a base of a tower, it is clear that **Csapo** as modified would disclose the GPS signal or stable timing signal is transmitted at a base of a tower as claimed (see **Csapo**, Fig. 9 and col. 8, lines 56-59), and would be inserted on a transmission medium to provide the timing signal to the oscillator of the frequency synthesizer.

6. Claims **30, 32, 41-42, 44, 55, 64-66** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Rudow** and further in view of **Quayle** et al (US Pat No. **6,865,169**).

Regarding claims **30, 32, 41-42, 55, 64**, the claims are rejected for the same reason as set forth in claim 1 above. However, Csapo fails to disclose a MMDS signal. However, **Quayle** discloses a base station which operates in MMDS bands (see col. 3, lines 10-31). Since **Csapo** suggests that the system can support a variety of protocols (see col. 7, lines 16-22), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Csapo to support MMDS system as disclosed in **Quayle**'s reference as well, for utilizing advantages of MMDS bandwidth such as providing high speed Internet access to subscribers.

Regarding claim **65**, the claim is rejected for the same reason as set forth in claim 8 above. In addition, Csapo as modified would disclose a GPS stable timing signal (see **Rudow**, col. 14, lines 31-36).

Regarding claims **44, 66**, the claims are rejected for the same reason as set forth in claim 8 above. In addition, it would have been obvious to one of ordinary skill in the art to provide an amplifier as claimed, for improving signal reception quality.

7. Claims **11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Rudow** and **Quayle** and further in view of **Nielsen** et al (US Pat No. **6,194,970**).

Regarding claims **11-13,** the claims are rejected for the same reason as set forth in claim 30 above. However, **Csapo** fails to disclose the GPS signal or stable timing signal is located at the upper portion of a tower. However, since **Nielsen** suggests that the GPS receiver be placed **high** relative to the surrounding terrain (see **col. 1, lines**

50-52), it would have been obvious to one skill in the art at the time the invention was made to further incorporate **Nielsen's** teaching to modify **Quayle, Csapo** and **Rudow** to place the GPS receiver at the upper portion of a tower, for improving signal reception quality due to closer distance to GPS satellites while reducing the blockage of GPS satellite signals caused by tall buildings.

8. Claims **33-34** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of in view of **Rudow** and further in view of **Komara** (US Pat No. **6,161,024**).

Regarding claim **33**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of redundant components in a communication system is well known in the art for backup failure components as disclosed by **Komara** (see Fig. 1 and col. 2, lines 15-40), it would have been obvious to one skilled in the art at the time the invention was made to incorporating **Komara** 's teaching to **Csapo** and **Rudow** to comprise such redundant components as recited in the claims, for providing a back up system to minimize disruptions of the communication system.

Regarding claim **34**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, it would have been obvious to one skilled in the art to provide a selector for redundant optic transceiver as claimed, in order to select only the current active optical signal for processing.

9. Claims **1-6, 8-10, 14-17, 22-29, 31, 35-40, 45-54, 56-62, 67-68** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo et al** (US Pat No. **6411825**) in view of **Nielsen et al** (US Pat No. **6,194,970**) and **Bickley et al** (US Pat No. **5,982,322**).

Regarding claims **8, 35, 57**, **Csapo** discloses a wireless communication system comprising an antenna located at a communication tower (see **Fig. 9** and **col. 6, lines 28-42**), comprising:

- a communication tower (see Fig. 9);
- an antenna (see Fig. 9, ref. 120);
- a frequency converter (implicitly disclose in col. 4, lines 43-50), wherein in order to convert a high frequency signal to a low frequency signal and vice versa, a frequency converter (sometime called mixer) is needed. Since "the block conveter" is just a mixer or frequency converter (see specification, line 23 of page 11), the frequency converter would read on the "block converter"
- a fiber optic transmitter (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optical/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, <u>Csapo would obviously disclose a fiber optic transmitter</u> when using the fiber cable for transmission;
- a fiber optic receiver (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optic/electrical conversion and an optic transmitter-receiver should be utilized.

Therefore, Csapo would obviously disclose a fiber optic receiver when using the fiber-optic cable for transmission;

- a converting system configured to convert a communication signal to a lower frequency signal, and to convert the lower frequency signal to an optical signal, and to transmit the optical signal to an optical receiving system (see col. 4, lines 43-50 and col. 6, lines 55-59). Since Csapo discloses a frequency converter, a fiber optic transmitter and a fiber optic receiver as explained above in the preceding paragraphs, it is clear that Csapo would obviously disclose such converting system when using a fiber-optic cable for transmission;
- a stable timing source located at a base of a tower (see Fig. 13, ref. 140 regarding GPS receiver, Time & Frequency Generator and col. 7, lines 22-26), wherein it is clear that the GPS timing signal is a "stable" timing signal (see specification, page 8, line 6);
- a GPS receiver (see Fig. 13, ref. 140);
- amplifiers (PA and LNA), a filter (see col. 7, lines 30-45);
- a frequency synthesizer (see), which would inherently generate a stabilized local oscillator signal;

However, Csapo fails to disclose the GPS "stable" timing signal is used to generate a "stable" oscillator signal. However, it is noted that since Csapo discloses that the GPS provide "accurate clock" and "frequency signals" to the main unit and the remote unit (PRU) (see **Csapo**, **col. 7, lines 22-27**), it would have been obvious to one

of ordinary skill in the art that such GPS "stable" timing signal would obviously be used as common time (or system timing reference) for the base station to compensate or periodically calibrate the timing reference of the oscillator as disclosed by **Nielsen** (see col. 3, lines 5-15, col. 4, lines 1-7 and col. 4, lines 50-56). By using the GPS "stable" timing signal as common time (or system timing reference) for the base station to compensate or periodically calibrate to timing reference of the oscillator, it is clear that the GPS timing signal would be used to calibrate the timing reference of the stable master oscillator of the frequency synthesizer, which in turn provide a stabilized oscillator signal to the frequency converter (or mixer) of a transceiver device as discussed by by **Bickley** (see **Figs. 3-4** and **col. 8, lines 1-19**). Therefore, by providing the GPS "timing signal" as a system timing reference for the base station to calibrate the stable master oscillator of the frequency synthesizer as disclosed by Nielse and Bickley, the claimed limitation are made obvious by **Csapo, Nielsen** and **Bickley**, for using a GPS timing signal to improve the stability of the oscillators of the base station.

Regarding claims **1-6, 9-10, 14-17, 22, 24-26, 29, 31, 36-40, 45-48, 50-52, 56, 58-62, 67**, it is clear that **Csapo** as modified would disclose block converter, GPS timing source, external receiver (GPS receiver), amplifier, filter, optic transmitter and optic receiver (when using a fiber-optic cable for transmission) as claimed, for the same reason as set forth in claim 8 above. Also note that the filter in Csapo's reference would obviously filter at least one member of a group comprising emissions and another communication as claimed, for improving signal reception quality.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a suppressor is well known in the art (Official Notice), for suppressing interferences, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Csapo, Nielsen** and **Bickley** to further provide a suppressor to suppress interferences as claimed, for improving signal reception quality.

Regarding claims **28, 49, 54**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, since the GPS receiver of the PMU is located at a base of a tower, it is clear that **Csapo** as modified would disclose the GPS signal or stable timing signal is transmitted at a base of a tower as claimed (see **Csapo**, Fig. 9 and col. 8, lines 56-59), and would be inserted on a transmission medium to provide the timing signal to the oscillator of the frequency synthesizer.

Regarding claims **27, 53, 68**, the claims are rejected for the same reason as set forth in claim 1 above. However, **Csapo** fails to disclose the GPS signal or stable timing signal is located at the upper portion of a tower. However, since **Nielsen** suggests that the GPS receiver be placed high relative to the surrounding terrain (see **col. 1, lines 50-52**), it would have been obvious to one skill in the art at the time the invention was made to further modify **Csapo, Nielsen** and **Bickley** to place the GPS receiver at the upper portion of a tower, for improving signal reception quality due to closer distance to GPS satellites while reducing the blockage of GPS satellite signals caused by tall buildings.

10. Claims **33-34** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Nielsen** and **Bickley** and further in view of **Komara** (US Pat No. **6,161,024**).

Regarding claim **33**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of redundant components in a communication system is well known in the art for backup failure components as disclosed by **Komara** (see Fig. 1 and col. 2, lines 15-40), it would have been obvious to one skilled in the art at the time the invention was made to incorporating **Komara** 's teaching to **Csapo, Nielsen** and **Bickley** to comprise such redundant components as recited in the claims, for providing a back up system to minimize disruptions of the communication system.

Regarding claim **34**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, as clearly seen in Fig. 1 of **Nielsen** regarding the redundant GPS receiver and selector 108 (see also col. 3, lines 44-54), it would have been obvious to one skilled in the art to provide a selector for redundant optic transceiver as well, in order to select only the current active optical signal for processing.

11. Claims **11-13, 30, 32, 41-44, 55, 64-66** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Nielsen** and **Bickley** and further in view of **Quayle** et al (US Pat No. **6,865,169**).

Regarding claims **30, 32, 41-44, 55, 64-66**, the claims are rejected for the same reason as set forth in claim 27 above. However, **Csapo** as modified fails to disclose a MMDS signal. However, **Quayle** discloses a base station which operates in MMDS

bands (see col. 3, lines 10-31). Since **Csapo** suggests that the system can support a variety of protocols (see col. 7, lines 16-22), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Csapo, Nielsen** and **Bickley** to support MMDS system as disclosed in **Quayle**'s reference as well, for utilizing advantages of MMDS bandwidth such as providing high speed Internet access to subscribers.

Regarding claims **11-13,** the claims are rejected for the same reason as set forth in claim 30 above. However, **Csapo** fails to disclose the GPS signal or stable timing signal is located at the upper portion of a tower. However, since **Nielsen** suggests that the GPS receiver be placed high relative to the surrounding terrain (see **col. 1, lines 50-52**), it would have been obvious to one skill in the art at the time the invention was made to further modify **Quayle, Csapo, Nielsen** and **Bickley** to place the GPS receiver at the upper portion of a tower, for improving signal reception quality due to closer distance to GPS satellites while reducing the blockage of GPS satellite signals caused by tall buildings.

12. Claims **1-6, 8-10, 14-17, 22-26, 28-29, 31, 35-40, 45-52, 54, 56-62, 67** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo et al** (US Pat No. **6411825**) in view of **Gehrke et al** (US Pat No. **6,185,429**).

Regarding claims **8, 35, 57**, **Csapo** discloses a wireless communication system comprising an antenna located at a communication tower (see **Fig. 9** and **col. 6, lines 28-42**), comprising:

- a communication tower (see Fig. 9);
- an antenna (see Fig. 9, ref. 120);
- a frequency converter (implicitly disclose in col. 4, lines 43-50), wherein in order to convert a high frequency signal to a low frequency signal and vice versa, a frequency converter (sometime called mixer) is needed. Since "the block conveter" is just a mixer or frequency converter (see specification, line 23 of page 11), the frequency converter would read on the "block converter"
- a fiber optic transmitter (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optical/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic transmitter when using the fiber cable for transmission;
- a fiber optic receiver (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optic/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic receiver when using the fiber-optic cable for transmission;
- a converting system configured to convert a communication signal to a lower frequency signal, and to convert the lower frequency signal to an optical signal, and to transmit the optical signal to an optical receiving system (see col. 4, lines 43-50 and col. 6, lines 55-59). Since Csapo discloses a frequency converter, a fiber optic transmitter and a fiber optic receiver as

explained above in the preceding paragraphs, it is clear that Csapo would obviously disclose such a converting system when using a fiber-optic cable for transmission;

- a stable timing source located at a base of a tower (see Fig. 13, ref. 140 regarding GPS receiver, Time & Frequency Generator and col. 7, lines 22-26), wherein it is clear that the GPS timing signal is a "stable" timing signal (see specification, page 8, line 6);
- a GPS receiver (see Fig. 13, ref. 140);
- amplifiers (PA and LNA), a filter (see col. 7, lines 30-45);
- a frequency synthesizer (see), which would inherently generate a stabilized local oscillator signal;

However, **Csapo** fails to disclose the GPS "stable" timing signal is used to generate a "stable" oscillator signal. However, **Gehrke** disclose a base station wherein the GPS "stable" timing signal is used to periodically correct clock errors of the oscillators, for improving stability of oscillators in order to provide good synchronization system (see **Fig. 2, ref. 208** and **col. 4, lines 13-19, col. 2, lines 9-24**). Since **Csapo** further discloses that the GPS provides "accurate clock" and "frequency signals" to the main unit and the remote unit (PRU) (see **Csapo, col. 7, lines 22-27**), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teachings of **Gehrke** to **Csapo** for using the GPS timing (or "accurate clock") signal to recalibrate clock errors of the oscillators of the PMU and of the PRU as well, thereby result in generating a "stabilized" oscillator signal as claimed, for improving

the stability of the oscillators. Therefore, by providing the "stabilized" local oscillator signal to the frequency converter, it is clear that Csapo as modified would disclose a "frequency converter" that would mix a communication signal with the "stabilized" local oscillator signal, thereby convert the frequency of the communication signal to a "stable" lower (IF) frequency signal, and would convert the "stable" lower (IF) frequency signal to an optical signal when using a fiber-optic cable for transmission, this would read on a "block coverter" or a "converter system" as claimed.

Regarding claims **1-6, 9-10, 14-17, 22, 24-26, 29, 31, 36-40, 45-48, 50-52, 56, 58-62, 67** it is clear that **Csapo** as modified would disclose block converter, GPS timing source, external receiver (GPS receiver), amplifier, filter, optic transmitter and optic receiver (when using a fiber-optic cable for transmission) as claimed, for the same reason as set forth in claim **8** above. Also note that the filter in Csapo's reference would obviously filter at least one member of a group comprising emissions and another communication as claimed, for improving signal reception quality.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a suppressor is well known in the art (Official Notice), for suppressing interferences, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Csapo** and **Gehrke** to further provide a suppressor to suppress interferences as claimed, for improving signal reception quality.

Regarding claims **28, 49, 54**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, since the GPS receiver of the PMU is located at a

base of a tower, it is clear that **Csapo** as modified would disclose the GPS signal or stable timing signal is transmitted at a base of a tower as claimed (see **Csapo**, Fig. 9 and col. 8, lines 56-59), and would be inserted on a transmission medium to provide the timing signal to the oscillator of the frequency synthesizer.

13. Claims **30, 32, 41-42, 44, 55, 64-66** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Gehrke** and further in view of **Quayle** et al (US Pat No. **6,865,169**).

Regarding claims **30, 32, 41-42, 55, 64**, the claims are rejected for the same reason as set forth in claim 1 above. However, Csapo fails to disclose a MMDS signal. However, **Quayle** discloses a base station which operates in MMDS bands (see col. 3, lines 10-31). Since **Csapo** suggests that the system can support a variety of protocols (see col. 7, lines 16-22), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Csapo to support MMDS system as disclosed in **Quayle**'s reference as well, for utilizing advantages of MMDS bandwidth such as providing high speed Internet access to subscribers.

Regarding claim **65**, the claim is rejected for the same reason as set forth in claim 8 above. In addition, Csapo as modified would disclose a GPS stable timing signal (see **Gehrke**, Fig. 2, ref. 208).

Regarding claims **44, 66**, the claims are rejected for the same reason as set forth in claim 8 above. In addition, it would have been obvious to one of ordinary skill in the art to provide an amplifier as claimed, for improving signal reception quality.

14. Claims **11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Gehrke** and **Quayle** and further in view of **Nielsen** et al (US Pat No. **6,194,970**).

Regarding claims **11-13,** the claims are rejected for the same reason as set forth in claim 30 above. However, **Csapo** fails to disclose the GPS signal or stable timing signal is located at the upper portion of a tower. However, since **Nielsen** suggests that the GPS receiver be placed **high** relative to the surrounding terrain (see **col. 1, lines 50-52**), it would have been obvious to one skill in the art at the time the invention was made to further incorporate **Nielsen's** teaching to modify **Quayle, Csapo** and **Gehrke** to place the GPS receiver at the upper portion of a tower, for improving signal reception quality due to closer distance to GPS satellites while reducing the blockage of GPS satellite signals caused by tall buildings.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. **Any response to this final action should be mailed to:**

Box A.F.

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(571) 273-8300 (for formal communications intended for entry)

(571)-273-7893 (for informal or draft communications).

Hand-delivered responses should be brought to Customer Service Window, Randolph Building, 401 Dulany Street, Alexandria, VA 22314.

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (571) 272-7893, Monday-Thursday (9:00 AM - 5:00 PM).

Or to Edward Urban (Supervisor) whose telephone number is (571) 272-7899.

Duc M. Nguyen
Jan 18, 2006